

Amendments to the Claims:

Please cancel claims 1-26 as presented in the underlying International Application No. PCT/DE2004/002482.

Please add new claims 27-57 as indicated in the listing of claims below.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-26 (canceled)

Claim 27 (new): A method for adjusting two objective lenses in a 4Pi system of a scanning microscope, the method comprising:

imaging a reference object in respective pupils of the objective lenses so as to form a respective Fourier image for each of the objective lenses from a respective image of the reference object; and

bringing the respective Fourier images into coincidence by moving at least one of the objective lenses relative to the other.

Claim 28 (new): The method as recited in claim 27 wherein microscope is a confocal scanning microscope.

Claim 29 (new): The method as recited in claim 27 further comprising recording the Fourier images by a camera.

Claim 30 (new): The method as recited in claim 29 wherein the camera includes a CCD camera.

Claim 31 (new): The method as recited in claim 29 further comprising monitoring the coincidence of the Fourier images using the recorded images.

Claim 32 (new): The method as recited in claim 29 further comprising analyzing the recorded images using image-processing software.

Claim 33 (new): The method as recited in claim 27 further comprising monitoring the coincidence of the Fourier images respectively by a first and a second photodiode respectively disposed in respective planes of the Fourier images.

Claim 34 (new): The method as recited in claim 33 further comprising moving at least one of the objective lenses in a plane orthogonal to an optical axis of the 4Pi system so as to achieve a respective maximum intensity value at each of the photodiodes.

Claim 35 (new): The method as recited in claim 34 further comprising storing respective xy-positions of the objective lenses in the plane, the respective xy-positions corresponding to the respective maximum intensity values of the photodiodes.

Claim 36 (new): The method as recited in claim 33 further comprising moving at least one of the objective lenses in a direction of an optical axis of the 4Pi system so as to achieve a maximum intensity value in a sum signal of the photodiodes.

Claim 37 (new): The method as recited in claim 36 further comprising storing respective z-positions of the objective lenses in the direction of the optical axis, the respective z-positions corresponding to the maximum intensity value of the sum signal of the photodiodes.

Claim 38 (new): The method as recited in claim 33 further comprising automatically interrupting a measurement when respective signal intensities of the photodiodes deviate from respective maximum values.

Claim 39 (new): The method as recited in claim 33 further comprising automatically readjusting at least one of the objective lenses when respective signal intensities of the photodiodes deviate from respective maximum values.

Claim 40 (new): The method as recited in claim 31 further comprising cyclically repeating the monitoring of the Fourier images at regular intervals during a measurement.

Claim 41 (new): The method as recited in claim 39 further comprising cyclically repeating the automatic readjusting at regular intervals during a measurement.

Claim 42 (new): The method as recited in claim 34 further comprising logging the moving performed during a measurement.

Claim 43 (new): An apparatus for adjusting two objective lenses in a 4Pi system of a scanning microscope, the device comprising:

an illumination device and an optical incoupling device configured to image a reference object in respective pupils of the objective lenses so as to form a respective Fourier image for each of the objective lenses from a respective image of the reference object; and

a lens moving device configured to move at least one of the objective lenses relative to the other so as to bring the respective Fourier images into coincidence.

Claim 44 (new): The apparatus as recited in claim 43 further comprising an excitation pinhole disposed in an illumination beam path so as to enable the scanning microscope to provide confocal scanning microscopy.

Claim 45 (new): The apparatus as recited in claim 43 wherein the reference object has a two-dimensional structure.

Claim 46 (new): The apparatus as recited in claim 43 wherein the reference object has a form of a cross-shaped aperture.

Claim 47 (new): The apparatus as recited in claim 43 wherein the reference object is provided outside the 4Pi system.

Claim 48 (new): The apparatus as recited in claim 43 wherein the illumination device includes a laser light source.

Claim 49 (new): The apparatus as recited in claim 43 wherein the optical incoupling device includes a beam splitter cube and a first lens.

Claim 50 (new): The apparatus as recited in claim 43 wherein the reference object is disposed directly on a side of the beam splitter cube facing the illumination device.

Claim 51 (new): The apparatus as recited in claim 43 further comprising a second lens configured to image the respective Fourier images onto a camera.

Claim 52 (new): The apparatus as recited in claim 51 wherein the camera includes a CCD camera.

Claim 53 (new): The apparatus as recited in claim 43 further comprising first and second photodiodes respectively disposed in respective planes of the Fourier images.

Claim 54 (new): The apparatus as recited in claim 53 wherein the photodiodes are respectively disposed in respective higher-order spaces of the respective Fourier images.

Claim 55 (new): The apparatus as recited in claim 54 wherein the photodiodes are disposed in accordance with a two-dimensional structure of the reference object so as to enable the first

photodiode to detect respective vertical patterns and the second photodiode to detect respective horizontal patterns of the respective Fourier images.

Claim 56 (new): The apparatus as recited in claim 43 wherein the lens moving device includes at least one piezoelectric actuator.

Claim 57 (new): The apparatus as recited in claim 56 further comprising first and second photodiodes respectively disposed in respective planes of the Fourier images, and wherein the at least one piezoelectric actuator is controllable as a function of at least one of respective signal intensities of the photodiodes and evaluation data from image-processing software.